UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

2/21/2014

REPLY TO THE ATTENTION OF:

Keith Nagel
Manager, Environmental Affairs
ArcelorMittal Indiana Harbor West
4020 Kinross Lakes Parkway
Richfield, Ohio 44286-9000

Re: **ADDITIONAL SITE INVESTIGATION REPORT FOR THE FORMER COKE PLANT ARCELORMITTAL INDIANA HARBOR WEST**

Dear Mr. Nagel:

We have completed our review of the January 17, 2014, Additional Site Investigation Report for the Former Coke Plant ArcelorMittal Iddiana Harbor West. Based on our review and previous reviews data gaps appear to remain a constant issue with investigation at the ArcelorMittal facility. Several areas of soil and groundwater contamination within the former coke plant have not been fully evaluated. More importantly, the existing sheet pile wall, supposedly constructed along the shoreline to prevent contaminated groundwater discharges into the Indiana Harbor Shipping Canal (IHSC) is breached along several lengths and is at best minimally functional. The continued discharge of contaminated groundwater into the IHSC now constitutes a major threat to the environment.

EPA's general and specific comments on the report are presented below. In an effort to further expedite the ongoing contamination investigation at the ArcelorMittal facility and to evaluate any potential remedy to address all affected contaminated media identified during the investigation, EPA is proposing the following path forward:

1) Provide EPA with your response to the attached comments. Submit these response along with any significant portions of revised text;

2) Upon EPA's review of your response, both parties shall agree to an established time to meet, discuss your response and discuss the potential for the completion soil contaminant delineation, propose possible remedy implementation at the Steel Slag Processing Area, North Lagoon and the Former Coke Plant area at the facility.

If you have any further questions or concerns please contact me at (312) 886-7954.

Sincerely,

Jonathan Adenuga
U.S. EPA Project Manager

Enclosure
bcc: Christine Liszewski

ATTACHMENT

GENERAL COMMENTS

1. In various sections (e.g., the Conclusions discussion on page 8), the report indicates that the former Coke Plant has been redeveloped through placement of geotextile fabric and up to six feet of clean, compacted granular slag-fill. The report asserts that these redevelopment activities have eliminated the direct contact exposure pathway, as previously identified slag/soil contamination is no longer within the typical contact zone (i.e., within the uppermost two feet of soil/fill at grade). To support this conclusion, ArcelorMittal must document the areal extent of the geotextile and fill, and confirm that at least two feet of fill were placed over all previously identified areas of contamination at concentrations above the direct contact data quality objectives (DQOs). If any of the contaminated soil remains within two feet of the amended ground surface, those areas should be re-evaluated for direct contact DQO exceedances, and the preliminary conceptual site model (CSM) in Figure 3 should be revised to account for that potential exposure pathway. Additionally, the report should describe any impacts placement of the geotextile and fill material has had on groundwater flow at the former Coke Plant.

2. As discussed in the report, the existing sheet pile wall is intended to exert hydraulic control over contaminated groundwater (shallow, intermediate, and deep) at the former Coke Plant, preventing it from discharging into the adjacent Indiana Harbor Ship Canal. As stated in Section 2.3, the breach in this wall led to a change in the scope of the investigation – elimination of the planned stepped-drawdown aquifer pumping test. This modification is acceptable, given ArcelorMittal's commitment to conducting any necessary large-scale aquifer testing as part of pre-design activities for the selected remedy. However, because it is such an important feature at the site, Figure 2 should be modified to clearly show the location of the existing sheet pile wall and the breached area.

3. The report concludes that aquatic organism exposures occur only when groundwater discharges into Lake Michigan. Based on the considerable distance between the former Coke Plant and Lake Michigan, ArcelorMittal expects that the observed on-site contaminant concentrations would be significantly reduced prior to discharge into surface water. The report does not address aquatic exposures that may be occurring at much higher concentrations within the Indiana Harbor Ship Canal. Although the sheet pile wall is generally effective in preventing discharges to the canal across the northeastern section of the shoreline, the wall has failed in the southwestern portion of the shoreline. Accordingly, there appears to be the potential that aquatic organisms will come into contact and/or ingest groundwater contamination above applicable ecological screening levels (ESLs). Revise the report to acknowledge this potentially complete pathway. Further action may be necessary to mitigate risks for those constituents that exceed

modified groundwater ESLs in wells immediately upgradient of the sheet pile wall breach.

4. In Section 8 of the report, Arcelor Mittal claims that all objectives of the investigation have been achieved (with the exception of those associated with the aquifer pumping test that was not performed). Specifically, the report claims that delineation is complete for LNAPL in the former benzol storage area, for soil impacts in the vicinity of the LNAPL, and for groundwater on the western side of the site. However, data gaps appear to remain:

   - The horizontal extent of soil contamination requires further delineation in the area east and west of the benzol storage area (i.e., west and northeast of boring SB-880).
   - The horizontal extent of soil contamination north of boring SB-875 is incomplete.
   - The vertical extent of soil contamination is not known (for at least one constituent above DQOs) at borings SB-875, SB-876, SB-878, SB-880, SB-881, SB-883, MW-809M, MW-822D, MW-824D, MW-826M, and MW-827S.
   - The western extent of LNAPL has not yet been determined.
   - Groundwater contamination east and west of the former benzol storage area requires further evaluation, especially given the westward component of groundwater flow across the northern portion of the site (as discussed in Specific Comment 2 below).
   - Several areas of groundwater contamination have not yet been fully evaluated. The extent of arsenic and thallium impacts around well MW-822 are unknown, and the western extent of arsenic and benzene exceedances in shallow groundwater along the western edge of the property between wells MW-801 and MW-814 has not yet been delineated.

   Additional investigation is recommended to close these data gaps. It should be noted that, in some cases, it may be possible to complete soil contaminant delineation concurrent with implementation of the chosen remedy.

5. Data boxes in Figures 10 through 13 should be amended to include all appropriate qualifiers (e.g., J for estimated results).

6. The report is misnumbered beginning with Section 6.2.2.3, Polynuclear Aromatic Hydrocarbons (PAHs) and carrying through the remainder of Section 6. Please correct the numbering throughout this section.

III. SPECIFIC COMMENTS

Section 2.2.2, Groundwater Sample Results, page 10

1. In the Conclusions section on page 10, the report mentions a clay layer beneath the aquifer which reportedly serves as an aquitard and defines the vertical extent of groundwater contamination. To further this argument, Sections 3.3.3 and/or 3.3.4 of the report should specify the depth of this clay layer and confirm that it is continuous across the site (including up to the Indiana Harbor Ship Canal). Geological cross-section diagrams provided as Figure 4 and 5 appear to indicate that the clay layer was encountered in most of the deep wells at an approximate depth of 40 feet below ground surface (bgs).

Section 2.2.2, Site-Specific Hydrogeology, pages 16 and 17

2. The second paragraph in this section indicates that shallow and deep groundwater flow is to the southeast. However, Figures 6, 7, and 9 suggest a more complicated groundwater flow regime beneath the site. Figure 6 shows shallow groundwater contours for October 2012, and indicates a groundwater high around well MW-825S and radially outward flow in all directions. Figure 7 shows shallow groundwater contours for July 2013 and indicates a southwestward component of flow across the northern half of the former Coke Plant site. Figure 9, showing deep groundwater contours from July 2013 echoes this southwestward flow between the northern property boundary and the area south of well MW-814S. These flow components should be acknowledged in the report, particularly in light of the fact that they affect areas in which contaminant exceedances have not yet been fully delineated.

3. The fourth paragraph in this section specifies which well pairs exhibit vertically downward and vertically upward gradients, based on data from July 2013. Accordingly to this section and the associated data in Table 2, upward gradients have been observed in well pairs MW-809S&D and MW-810S&D, in the vicinity of the sheet pile breach. Appropriate sections of the report (e.g., Section 7.5) should be expanded to evaluate the possibility that contamination in deep groundwater immediately upgradient of the sheet pile wall is upwelling and discharging into the canal through the breach, where the upper 25-foot portion the wall was removed due to failure.

Section 4.1, Soil Sample Data Quality Review, pages 18-20

4. The discussion of quality control samples in this section only addresses duplicates, method blanks, and matrix spike/matrix spike duplicate samples. However, Section 6.5 of the Work Plan for this effort also called for field blanks and trip blanks. Table 3 of the report indicates that trip blanks were collected during this investigation, but there is no indication that field blanks were also obtained. Expand the report to discuss collection of

those quality control samples, associated analytical results, and impacts on the data obtained during this investigation.

5. According to this section's discussion of completeness, the planned second sample was not collected from borings MW-825S, MW-826S, MW-826M, SB-873S, and SB874S due to the presence of debris or poor recovery in the sample interval immediately above the water table. Even though ArcelorMittal collected additional soil samples to meet project completeness goals, the omission of intermediate depth samples from these locations appears to have created a data gap in contaminant delineation.

   As shown on Figure 10, the shallow samples (1-2 feet bgs) from borings MW-825S and MW-826M reported exceedances of the Indiana Department of Environmental Management (IDEM) direct contact and default closure levels for three PAHs. As noted in the third full paragraph on page 30, there is no need to further delineate the vertical extent of contamination for direct contact considerations. The text on page 30 addresses impact to groundwater considerations, but that DQO was not exceeded in the shallow samples from borings MW-825S and MW-826S. However, the text on page 30 should be corrected to note that indeno(1,2,3-cd)pyrene did exceed the groundwater solubility DQO in well MW-826M. The report does not address vertical delineation of PAHs above default closure values in these two locations. Expand the report to explain why this issue is not perceived to be a data gap for the investigation.

6. This section indicates that a third, unplanned soil sample was collected from borings SB-872, SB-876, SB-880, and SB-881 due to the presence of strong odors and elevated photoionization detector (PID) measurements. Boring logs provided in Appendix A indicate that PID readings from the sampled intervals ranged from 57.7 to 9,999 units. However, the log for boring SB-877 shows an odor and PID reading of 211 units in the interval from 9-10 feet bgs. This measurement is higher than those measured in three of the borings from which additional samples were collected. The report should be expanded to explain why no sample was collected from the identified interval in boring SB-877. Additionally, because these elevated PID readings were measured just above the water table, the report should clarify whether the observed readings are believed to be associated with a soil source (possibly at borings SB-876 and SB-880) and or to contamination in underlying groundwater (possibly at borings SB-872, SB-877, and SB-881).

Section 4.2, Groundwater Sample Data Quality Review, pages 20-22

7. The list of field duplicate samples in the third full paragraph on page 21 should be corrected. Although the samples were initially listed as pairs (e.g., MW-801D-GW and MW-801D-GW-D), the later samples are listed only individually. Moreover, the text as currently written appears to indicate that samples MW-805D-GW and MW-807S-GW were submitted and evaluated as duplicates of each other. Correct the paragraph to accurately list duplicate samples collected from wells MW-805D, MW-807S, MW-809M, MW-823S, and MW-825S.

Section 5.3, Monitoring Well Installation, page 25

8. According to Section 6.2 of the Work Plan, deep monitoring wells were to be installed with 3-foot screens. However, the text of this section indicates that monitoring wells installed during this investigation were constructed with 5- and 10-foot screens. A review of well logs in Appendix A confirms that the three new deep wells (MW-822D, MW-823D, and MW-824D) were indeed installed with 3-foot screens. The text of Section 5.3 should, therefore, be corrected accordingly.

Section 5.4, Groundwater Sampling Procedures, pages 25 and 26

9. As stated in Section 6.2.1 of the report, light nonaqueous phase liquid (LNAPL) was observed in monitoring wells MW-820S and MW-821S. Expand the groundwater sampling procedure on page 26 to specify the means by which groundwater was collected from these wells without LNAPL becoming entrained in the sample.

Section 6.1, Slag-Fill/Soil Sample Results, pages 28-30

10. The third paragraph in this section should be corrected to note that only DQO exceedances, not the full list of tabulated results, are presented on Figure 10.

Section 6.2, Groundwater Sample Results, page 30

11. According to Table 4-1B of the Work Plan, groundwater samples collected during the subject investigation were to be analyzed for hardness via method M2340B (19^{th} edition). However, based on a review of Table 7, it does not appear that this parameter was actually evaluated. Expand the report to explain why this parameter was eliminated from the testing program and to discuss any potential data gaps created by this omission.

Section 6.1.2.3 (sic), Polynuclear Aromatic Hydrocarbons, page 35

12. As per Table 10 and Figure 11, this section should be expanded to note that benzo(a)pyrene also exceeded its IDEM maximum contaminant level (MCL) in well MW-821S in November 2012.

Section 6.1.2.4 (sic), Select Metals, pages 35 and 36

13. As per Table 10 and Figure 11, the last paragraph on page 35 should be expanded to note that thallium also exceeded its IDEM MCL in well MW-803S in October 2012. Similarly, the first paragraph on page 36 should note that arsenic was also reported above its IDEM MCL in well MW-805S in July 2013.

14. The fourth paragraph on page 36 should be corrected to specify that the oxidation-reduction potential measured in well MW-809D in July 2013 was -414 millivolts (mV), instead of -324 mV. The actual detected value is indicative of even more strongly reducing conditions in the Calumet Sand, and helps to explain the high level of arsenic (0.2 milligrams per liter) detected in groundwater samples collected from well MW-809D during that monitoring event.

Section 6.1.2.6 (sic), Applicability of Ecological Screening Levels, pages 37-40

15. For consistency with Table 7, please remove the reference to well MW-808D with regard to zinc at the top of page 38.

16. Table 11 compares maximum constituent concentrations in groundwater against relevant ESLs, groundwater standards, and modified groundwater standards (i.e., 10 times the promulgated groundwater standard). As shown in the table, concentrations of four constituents exceeded the modified groundwater ESL standard: arsenic, benzene, toluene, and pentachlorophenol. Accordingly, the last paragraph of this section (on page 40) appears to be inaccurate. Moreover, all four constituents should be carried forward for further consideration in terms of ecological risks.

Section 7.1, Site Geology and Hydrogeology, page 43

17. This section is inconsistent with Section 3.3.4 of the report with regard to depth to the water table. The elevations above mean sea level are relatively consistent between the two sections. However, Section 7.1 states that these elevations correspond to depths of 3-11 feet bgs, and Section 3.3.4 states that they correspond to depths of 6-15 feet bgs. This discrepancy in the report should be corrected.

Section 7.2, Soil Conditions, pages 43 and 44

18. The first full paragraph on page 44 should be corrected to note that benzo(a)pyrene exceeded its IDEM default closure level in the sample collected from 1-2 feet bgs in boring MW-823D, rather than the deepest sample interval from 40-41 feet.

Section 7.4, LNAPL Conditions, page 46

19. Because LNAPL has been identified in shallow wells MW-820S and MW-821S, it would seem appropriate to document the inferred extent of LNAPL on Figure 11 (DQO Exceedances in Shallow Groundwater), rather than on Figure 13 (DQO Exceedances in Deep Groundwater). If this was an intentional choice, additional discussion should be provided on the correlation between observed LNAPL and deep groundwater contamination.

Figure 10, DQO Exceedances in Soil

20. According to Table 5, the exceedance of the benzene DQOs in boring MW-809M was reported in the sampling interval from 8-9 feet bgs. Correct the figure as appropriate.

Figure 11, DQO Exceedances in Shallow Groundwater

21. This figure needs to be revised to include two exceedances identified on Table 10. Methylene chloride exceeded its MCL in well MW-808S, and indeno(1,2,3-cd)pyrene exceeded the groundwater solubility DQO in well MW-819S.

Figure 12, DQO Exceedances in Intermediate Groundwater

22. Amend the data box for well MW-826M to show that the benzene concentration measured in July 2013 exceeded its IDEM MCL.

Figure 13, DQO Exceedances in Deep Groundwater

23. Amend the data box for well MW-801D to show that the measured arsenic concentrations only exceeded the MCL DQO. Also revise the data box for well MW-807D to show that the methylene chloride concentration from November 2013 exceeded the MCL. Per Table 10, the methylene chloride concentration in well MW-808D in November 2012 should be listed as 0.84 milligrams per liter.

Figure 14, Benzene Isoconcentrations in Shallow Groundwater

24. Because the extent of contamination in shallow groundwater around the former benzol storage area has not yet been delineated, isoconcentrations on this figure should be drawn with dashed lines. Dashed lines should also be used to identify the northern extent of contamination in shallow groundwater adjacent to the Indiana Harbor Ship Canal.

Figure 16, Benzene Isoconcentrations in Deep Groundwater

25. The extent of contamination in deep groundwater west of the former benzol storage area has not yet been delineated. Consequently, isoconcentrations on this figure should also be drawn with dashed lines.

Table 11, Evaluation of ESLs

26. According to Table 10, the maximum concentration of vanadium should be listed as 96 micrograms per liter (µg/L), and the maximum concentration of phenol was 120,000 µg/L in well MW-808D. Finally, the reported maximum total phenolic

concentration listed in Table 11 (420,000 µg/L) was actually detected in well MW-808D. The maximum detection of indeno(1,2,3-cd)pyrene should also be listed on this table for ESL comparisons. Correct the table as appropriate.